

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



UNITED STATES
DEPARTMENT OF AGRICULTURE

DEPARTMENT CIRCULAR 254

Washington, D. C.

Issued July 1, 1923
Revised August, 1923

HOMEMADE APPLE AND CITRUS PECTIN EXTRACTS
AND THEIR USE IN JELLY MAKING.

MINNA C. DENTON, RUTH JOHNSTIN, and FANNY WALKER YEATMAN.

Bureau of Home Economics.

CONTENTS.

	Page.		Page.
Directions for making pectin extracts.....		Use of the pectin extracts.....	5
Apple pectin extract.....	2	Directions for making jellies	
Citrus pectin extract from fresh		with pectin extracts.....	7
peel.....	3	Score card for jelly.....	11
Citrus pectin extract from dried			
peel.....	4		

This circular describes household methods for extracting pectin from apples and the white peel of oranges and lemons, and gives recipes for the making of several typical kinds of jelly by the addition of these extracts.

Experience has taught the jelly maker that certain fruits can be used for jelly making with almost certain success, others are much less certain in their results, while some are not commonly considered suitable for jelly making.

Scientific study of the principles of jelly making has shown that three ingredients are required for the formation of a jelly, namely, sugar, acid, and pectin; and these must be present in fairly definite proportions. Tart apples, cranberries, red currants, and grapes, when collected at the proper stage of ripeness, contain pectin and acid in sufficient quantity to form a good jelly when cooked for a short time with the proper amount of sugar. Grapes when fully ripe, raspberries, strawberries, peaches, pears, cherries, and rhubarb, are often more or less deficient in natural pectin or acid or both, and the making of jelly from these juices by the usual household method is often attended with difficulty and uncertainty. The addition of acid, e. g., in the form of lemon juice, is in some instances highly beneficial to jelly texture even though no pectin is added.

The use of homemade pectin extracts to supply the deficiency in juices low in pectin has several advantages. When prepared according to the directions here given, the extracts prove fairly reliable as to jelly-making qualities and can be used in small and measured amounts. Since the essential ingredients are thus under the control

of the worker the results are much more certain than would otherwise be the case. Most of these pectin extracts with the exception of those made from very tart apples or from cores and skins are lacking in pronounced flavor. In any case they do not greatly modify the natural flavor of the fruits to which they are added, since the proportion used is small. By their use it is possible to utilize fruit which might otherwise be discarded, either because it has become too ripe, or because it is naturally lacking in pectin at all stages of ripeness, and therefore not suited to jelly making. The addition of the pectin extracts is a distinct advantage also in the case of those juices which are usually concentrated or boiled down before using, since the extra heating, which is likely to change the color and flavor of the juice and also reduce the yield, is thus rendered unnecessary. Attractive jellies of good flavor are secured by the use of pectin extracts with such materials as strawberries, rhubarb, ripe red and black raspberries, fresh or canned pineapples, peaches, and cherries; and the yield of jelly is equal to that obtained from fruit of the best jelly-making quality.

It should be clearly understood, however, that pectin extracts should not be used to conceal the inferiority of watered juices. They should be used only in relatively small amounts with rich, full-flavored juices which are lacking in natural pectin or which would have to be concentrated before making the jelly. That is to say, pectin extracts should be used only when they improve the quality of the resulting jelly or make it possible to prepare jelly from fruits which could not otherwise be utilized for this purpose.

DIRECTIONS FOR MAKING PECTIN EXTRACTS.

APPLE PECTIN EXTRACTS.

Choice of fruit.—The fruit should be firm, free from decay and wormholes, tart, and hard ripe rather than mealy. Apples which do not bring the highest market prices because of surface blemishes and deformities and sound culls are often entirely suitable for the making of pectin extracts. Some apples of comparatively insipid flavor, such as Ben Davis, may be successfully used for this purpose if taken at the proper stage of ripeness. It is of little use to attempt the process with mealy, nonacid, or overripe apples in which the pectin and acid constituents have been materially decreased by ripening.

Preparation of fruit.—The apples should be cleaned by thorough scrubbing; they need not be cored or pared, but stems and imperfect spots should be removed. A considerable amount of pectin of very satisfactory quality can be extracted from the cores and parings alone, but this extract does not have such a pleasant flavor as that obtained from the whole apples.

Extraction of pectin.—Convenient quantities to use are:

4 pounds apples.

4½ pints water for the first extraction.

Slice the apples thin; this is better than passing them through a meat grinder, since finely ground apples darken very quickly, and impart an unattractive color to the pectin extract. Place in a granite saucepan large enough so that the whole mass can be brought quickly to boiling. Cover the pan and boil the mixture rapidly for 20 minutes. Rapid boiling is recommended because it seems to preserve

color and flavor better than long, slow boiling, and extracts the pectin with less danger of decomposing it through overheating.

When the boiling is finished, strain the mass through four thicknesses of cheesecloth until the juice ceases to drip. It is not advisable to squeeze the bag; but the pomace, or pulp, may be lightly pressed with a spoon, toward the end of the dripping period, to force the flow of the last drops of the juice.

When dripping is complete, remove the pomace from the bag, weigh or measure it, return it to the saucepan, and add an equal quantity of water. Boil again for 20 minutes, and strain. The first two extractions should together amount to about 3 quarts. Mix them together in a wide granite pan, such as a dish pan, large enough so that the liquid will not be more than 2 inches deep. Heat rapidly until the liquid is reduced to one-fourth of its original volume, or to about $1\frac{1}{2}$ pints; this usually requires from 30 to 45 minutes. The concentration should be carried on rapidly, since it is easy to injure the pectin if the boiling process continues for several hours.

The apple pectin extract of extra strength required in the recipes for jellied sliced peaches (p. 8) and jellied fresh strawberries (p. 9) should be reduced to 1 pint.

The concentrated juice is a thick sirupy liquid which usually has a good apple flavor; its color varies from dark to light reddish brown, according to the kind of apples used, the color of their skins, and the promptness with which the material has been handled. When cold, there is a heavy sediment, which contains considerable pectin.

If it is desired to preserve the pectin extract for use with fruits which come at another season, it should be poured while boiling hot into clean jars or bottles which have been standing in boiling water, and sealed at once. If large amounts of jelly are to be made at one time, the pectin extract may, of course, be stored in jars of any convenient size. Otherwise small bottles holding about 1 gill or one-half cup are recommended, in order to do away with the necessity for reheating the extract or reprocessing a jar to prevent spoilage, each time a part of the contents is removed.

CITRUS PECTIN EXTRACT FROM FRESH PEEL.

Choice and preparation of fruit.—Thick-skinned oranges and lemons are best to use for this purpose. The fruit should be washed and wiped dry; and the outer yellow rind, which would impart an undesirable flavor, should be carefully pared off, using a silver or glass knife, or a steel blade which does not stain. It is easier to remove this rind before the fruit is cut than afterwards.

After the yellow skin is removed the white peel is cut off in as large pieces as possible, care being taken that none of the fruit pulp adheres to it. If as much as one-half pound of peel is collected at one time, the extraction of the pectin may be made at once. If, however, the peel is collected from time to time in smaller amounts, it can be dried and kept either until there is a sufficient quantity to make the process of extraction practical, or until the jelly is to be made.

Making the extract.—Convenient quantities to use are—

1 pound fresh white peel.

2 quarts water for each extraction.

3 level teaspoons tartaric acid for each extraction.

The use of tartaric acid (powdered tartaric, U. S. P.) is recommended, since it has been found that the amount of pectin thus extracted is considerably greater than when water alone is used. Lemon juice has often been suggested for this purpose, but its composition is variable, and it sometimes gives rise to undesirable flavors.

Add the acid to the water and stir until dissolved. Put the fresh peel through a meat grinder, using the coarse blade, then place it in a granite saucepan large enough to permit rapid boiling, cover it with the acid solution, and allow it to stand for one to two hours. Just before beginning to heat, measure the depth of the material in the pan. This may be done by standing a silver knife or spoon handle upright in it and then noting this depth in inches. Boil the mixture rapidly and stir constantly until the volume is reduced to a little less than half of the original, measuring the depth as before. Strain through four thicknesses of cheesecloth and allow to stand until dripping is complete. The dripping may be hastened a little by pressing the mass lightly with a spoon.

Two more extractions are made in the same way, adding 2 quarts of water and 3 teaspoons of tartaric acid to the pomace each time. It is not necessary, however, to allow the pomace and acid solution to stand for an hour before heating, as it was in making the first extraction.

Mix the three extractions together. If the peel has been cooked according to the directions given, a little less than 1 pint of strained liquid should be obtained as a result of each extraction, and the total amount from a pound of peel should be about $2\frac{1}{2}$ pints. The extract from citrus peel is a thick, somewhat sirupy liquid having a pale sediment and no very pronounced flavor. Pectin extracts should always be shaken before using, as the sediment contains much pectin.

The use of the pressure cooker in making citrus pectin extracts has not been found advantageous. Apparently citrus pectins are partially decomposed at high temperatures, since extracts prepared under pressure do not have as great jellying power as those made in the open kettle.

Citrus pectin extracts can be stored in much the same way as directed for storing apple pectin extract. It has been found, however, that citrus pectin extract does not always keep so well as does the apple pectin extract. If it is intended to store the pectin in warm weather the sealed bottles of one-quarter pint or 1-gill size should be heated in a boiling-water bath for 20 minutes. Citrus pectin extract treated in this way seems to keep well, although its flavor is somewhat stronger than when freshly prepared. Small containers are advisable, so that when a jar is opened all of the contents may be used at once and none need be lost by spoilage. If larger amounts are to be used at one time, however, there is no reason why ordinary fruit jars should not be used as containers. Pint or quart jars, if full, should be processed in a boiling-water bath for 30 minutes.

CITRUS PECTIN EXTRACT FROM DRIED PEEL.

Preparation of dried citrus peel.—A much simpler method of storing citrus pectins is to dry the fresh peel and preserve it in this dried form. It may then be extracted at any time, in the quantity which is needed for the occasion.

The white peel which has been removed from the fruit in as large pieces as possible is spread out on a suitable flat surface, preferably a wire bread or cake rack or a piece of wire screen covered with cheesecloth, and dried in a warm place where there is free circulation of air, as over a hot-air register or over hot water or steam pipes, or at the back of a coal range. Do not allow it to get hot, as it then discolors easily and may develop an unpleasant flavor.

The peel dries very quickly. The loss in drying varies somewhat, but averages about 75 per cent, so that one-fourth pound of the dried peel is roughly equivalent to about 1 pound of fresh peel. When quite dry it should be placed in sealed containers where it can be protected from insects.

Making the extract.—Convenient quantities to use are:

½ pound dried peel.

10 cups water for each extraction.

3 level teaspoons tartaric acid for each extraction.

Pectin can be extracted from this dried peel, following the same procedure as with fresh peel. The dried peel should be cut in very small pieces, using scissors rather than a meat grinder, to avoid discoloration. Soak in the acid solution 4 or 5 hours before the first extraction. Then follow directions for extraction from fresh peel (p. 3). The amount of pectin extract from one-fourth pound of dried peel should be the same as that obtained from 1 pound of fresh peel—that is, about 2½ pints from one-fourth pound dried lemon peel, or 2 pints from the same amount of dried orange peel.

The simplest method for using the dried citrus peel would seem to be to add it to the fresh fruit and extract both the pectin and the fruit juice with one heating. Upon some occasions this process has, indeed, proved perfectly satisfactory. However, many fruits require but a short time for cooking, in which case a sufficient amount of pectin might not be extracted from the peel. In any case it is hardly possible to estimate in advance the amount of juice which will be obtained from a given amount of fruit and the amount of dried peel which should be added to secure a jelly of the tender quality demanded of the best homemade products. Directions have therefore been given above for the preliminary extraction of pectin from the dried peel, and those for the addition of this liquid extract in suitable quantities to various fruit juices in question will be found on pages 7 to 11.

The extract from the dried peel is somewhat darker than when the fresh peel is used. It has about the same jellying power, and if the peel has been carefully dried the flavor of the extract is mild.

USE OF THE PECTIN EXTRACTS.

In general it is worth while to use the pectin extracts with strawberries, and with fully ripened grape, raspberry, and blackberry juices, either fresh or canned or bottled; with cherry juice, rhubarb juice, orange or lemon or grapefruit juice, or combinations of these, and with pineapple juice; and even with green tomato juice if the resulting flavor is fancied. Pear and peach jellies can also be made by the aid of pectin or acid, or both: as a rule their flavor is not characteristic of the fresh pear or peach, unless slices of the whole

fruit (cooked for a very brief period) are included in the jelly. The sirup left from making sweet pickles, preserves, or from open-kettle canning of peaches or pears can be made into jelly or jellied jam by the use of pectin extract. It can not be expected that such a jelly will be clear or translucent; however, its flavor may be excellent.

It is true that many jellies and jams made from certain small fruits, whether with or without pectin, are better when freshly prepared than after some months of storage; in time they are likely to darken in color, lose more or less of their distinctive flavor, and develop a certain astringency. It is, therefore, well to use them before they are 6 months old, particularly in the case of strawberry, cherry, and rhubarb jellies. The flavor of red raspberry, black raspberry, and blackberry jellies is more nearly permanent.

The question as to whether pectin extract shall be made from apples or from citrus fruits is usually one of relative convenience and expense. It is natural that those who live in regions where apples are plentiful and cheap should prefer to make apple pectin extract while those who find it easier to accumulate orange or lemon peel or cheaper to purchase citrus fruit than apples, will be desirous of turning into account the more inexpensive material, or that which would otherwise be a waste product. Under some circumstances, however, the question must arise, Which of these extracts is preferable, and under what conditions?

The most important point to consider is, how well the flavors of the fruit juice to be jellied and that of the given pectin extract will combine. It is not always easy to prophesy as to this. Apple pectin extract in general combines successfully with most fruit flavors. If used in generous proportions it may dilute the flavor of other fruits somewhat, but a delicately flavored juice is seldom overpowered unless very tart apple pectin extract is used.

It is, however, quite out of the question to use apple-pectin extract with such juices as pineapple, orange, lemon, or grapefruit, if a clear amber jelly is desired. Even with rhubarb, apple pectin extract often produces a dark, cloudy jelly instead of the transparent, brightly tinted product which may be secured by the use of the practically colorless orange or lemon pectin.

Lemon pectin extract as made by the directions given in this circular can not easily be detected by taste when combined with fruit juices, if the yellow peel has been thoroughly trimmed off. In orange peel, the oil glands often run deeper, and their lower ends can not always be removed entirely from the white peel. Either for this reason or for some other, orange pectin extract does upon some occasions impart a flavor somewhat suggestive of orange marmalade, especially when used in large amounts with juices of delicate flavor.

If the fruit juice to be jellied is conspicuously lacking in acid as well as in pectin, it may be necessary to add lemon juice when using lemon or orange pectins. Apple pectin is likely to contain sufficient acid of its own, yet the addition of a small amount of lemon juice is sometimes beneficial even when apple pectin is used. Ripe quinces may need added acid rather than added pectin for jelly making.

It must be remembered that highly acid juices which call for an increase in sugar above the amount given in these recipes also call

for an increase in pectin to balance that sugar. An increase of sugar from three-fourths cup for each cup of juice to 1 cup of sugar per cup of juice may need to be accompanied by an increase from 5 tablespoons of orange pectin extract to 6 tablespoons.

Another very good use to which pectin extracts may be put is in shortening the process of making jam from fruits which are deficient in pectin. This process is often a tedious one, owing to the long cooking necessary before the fruit thickens sufficiently and to the constant stirring required in order to prevent burning. It may often be much shortened by the addition of pectin extract to the fruit after it has been mashed and cooked for a few minutes with an equal amount of sugar. When pectin extract and sauce have been thoroughly mixed and heated through, the jam is ready to pour into glasses. Naturally its flavor is more like that of the fresh fruit than when it has been cooked for an hour or more; also the number of glasses obtained from a given amount of fruit is somewhat greater.

Still another use for apple pectin extract from whole apples is in the making of a frozen dessert. A delicious sherbet may be made by combining 1 cup of rich, tart apple pectin, 1 cup of sugar, 1 cup of milk, 1 cup of cream, a few grains of salt, and from 1 teaspoon to 1 tablespoon of lemon juice if desired. Freeze by usual methods employed for making ice cream.

DIRECTIONS FOR MAKING JELLIES WITH PECTIN EXTRACTS.¹

The ordinary process of jelly making is fairly familiar to most housewives. The fruit is prepared and cooked to extract the juice, the juice is strained, and "boiled down" if necessary, then the sugar is added, and the mixture is boiled until the jelling point is reached, i. e., until the hot liquid sheets instead of forming drops from the edge of the spoon.

CHERRY JELLY WITH ADDED PECTIN AND ACID.

1 cup cherry juice.
1 to 1½ cups sugar.

4 tablespoons apple or lemon pectin extract, or 6 tablespoons orange pectin extract.

To prepare the juice, thoroughly wash the cherries and remove the stems and pits. Place in a saucepan, adding one-fourth cup of water for each pound of fruit. Heat to boiling and boil 10 minutes. Strain through four thicknesses of cheesecloth. Mix the juice with the remaining ingredients in the proportions indicated and cook until the jelly test is reached.

The best jelly is made from rather sour cherries of high flavor. It is clear and has a red color and because of its tartness is especially suitable for serving with meat. (See par 2, p. 6.)

LEMON JELLY WITH ADDED PECTIN AND ACID.

4 tablespoons lemon pectin extract.
¾ cup water.

2 to 4 tablespoons lemon juice.
¾ cup sugar.

¹In connection with the use of these recipes, attention is called to patents Nos. 1,067,714, 1,235,666, 1,304,166, 1,362,869, 1,393,660, and 1,410,920, which involve the use of concentrated pectin extract in the making of jams and jellies. The department assumes no responsibility where use of the recipes could be regarded as an infringement.

Mix the sugar, pectin, and water and boil rapidly until the jelly test is reached. Then add the lemon juice and boil until jelly test again appears. A clear, brilliant, amber-colored jelly should result. Its flavor is quite acid.

JELLIED SLICED PEACHES WITH ADDED PECTIN AND ACID.

2 cups (1 pound) sliced peaches.
3½ cups (1½ pounds) sugar.

½ cup apple pectin extract, extra strength (p. 3), or ½ cup lemon or orange pectin extract.

Use sweet, fully ripened fruit of rich flavor; it is essential to use fruit of the highest quality, if a superior product is to be obtained, since the flavor of the cooked preserve can not be expected to excel that of the raw material.

Peel the peaches and remove the pits, then slice very thin, about one-eighth inch in thickness. Measure this sliced fruit, add the sugar, and mix carefully. Heat slowly over a low flame or at the back of the stove, stirring constantly, until the juice flows freely and the sugar is dissolved. Then increase the heat and bring to a vigorous boil as rapidly as possible. A very short time of heating is essential if the fresh flavor is to be preserved. Boil hard for one minute with continual stirring. Remove from the fire and add the pectin. Mix well, skim if necessary, and pour at once into glasses.

The merit of this recipe lies in the fact that the characteristic flavor of fresh peaches is not destroyed by the short cooking, and is well preserved when the peaches are embedded in jelly. Even in those cases where the jelly fails to set well because of excess of juice or lack of pectin, the product should still be found worth while because of its superior flavor.

FRESH PINEAPPLE JELLY WITH ADDED PECTIN AND ACID.

1 cup ripe pineapple juice.
5 tablespoons lemon pectin extract.

1 cup sugar.
1 teaspoon lemon juice.

Cut (do not grind) fresh, ripe pineapple into as small pieces as possible, place in a granite pan, and add one-half cup of water to each cup of fruit. Cook until the pineapple begins to soften, then strain through four thicknesses of cheesecloth, using gentle pressure with a spoon.

To each cup of juice add 1 cup of sugar, and the lemon pectin and lemon juice as indicated above. Boil until the jelly test appears. Skim if necessary.

CANNED-PINEAPPLE JELLY WITH ADDED PECTIN AND ACID.

Pineapple jelly may also be made from the juice of canned pineapple by the addition of orange or lemon pectin extract. Use only a first-grade product of good flavor, canned in heavy sugar sirup, and without any suggestion of metallic contamination.

1 cup canned-pineapple juice.
½ to ¾ cup sugar.
1 teaspoon lemon juice.

7 tablespoons orange pectin extract, or
5 tablespoons lemon pectin extract.

Mix the ingredients and boil rapidly until the usual jelly test is obtained.

JELLIED CANNED PINEAPPLE WITH ADDED PECTIN AND ACID.

1 pound finely cut canned pineapple.	$\frac{1}{2}$ cup lemon pectin extract.
$1\frac{1}{4}$ pounds sugar.	2 teaspoons lemon juice.

Drain the pineapple free from juice, then cut (do not grind) into very small pieces. Place in a bag made of four thicknesses of cheesecloth, and squeeze slightly to remove any remaining liquid.

Mix the fruit, sugar, and lemon juice well together and heat over a low flame until the sugar is dissolved. When the mixture begins to boil, increase the heat, and boil vigorously for 1 minute with constant stirring. Remove from the stove, skim, add the pectin, and stir from time to time until somewhat cool. Then place in jelly glasses and seal as soon as cold.

RHUBARB JELLY WITH ADDED PECTIN AND ACID.

1 cup rhubarb juice.	$1\frac{1}{4}$ cups sugar.
6 tablespoons lemon pectin extract.	

This jelly is best when made from very young, tender, and succulent rhubarb of mild flavor and with very little green color, since the green tissue is likely to darken in cooking. The jelly should have an acid but otherwise mild flavor, and a bright, red color. If made with lemon pectin it should be clear and transparent; if made with apple pectin the color and appearance may not be so attractive, though the flavor and texture should be fairly good. The flavor of old rhubarb is apt to be strong; when it is to be used, the addition of one or two pieces of lemon or orange peel to the stems as they cook may perhaps be considered an improvement.

Wash and trim stalks of rhubarb, being careful not to remove the pink skin. The addition of extra skin improves the color of the juice. Cut into half-inch pieces and place in a granite pan. Add 1 cup water for each pound of rhubarb. Cook until tender, then strain through four thicknesses of cheesecloth. There should be about $1\frac{1}{4}$ cups of juice for each pound of rhubarb.

Add other ingredients to the juice in the proportions indicated above, and boil. The ordinary jelly test can not always be depended upon in the case of rhubarb, particularly if the stalks are not very young and tender, because there are certain gummy substances present which cause the hot juice to sheet from the edge of the spoon, but which do not assist in making a jelly. It is therefore wise to cook somewhat beyond the usual jelly test.

JELLIED FRESH STRAWBERRIES WITH ADDED PECTIN AND ACID.

1 pound choice berries (hulls removed).	$\frac{1}{2}$ cup lemon or orange pectin extract, or $\frac{1}{4}$ cup apple pectin extract, extra strength (p. 3).
$1\frac{1}{2}$ pounds sugar.	
2 to 4 teaspoons lemon juice (if desired).	

The delicious flavor of this whole fruit jelly is due to the short cooking period which allows the flavor of the fresh fruit to be preserved. (See par. 2, p. 6.)

Only choice fruit of rich flavor should be used; the remarks made in this connection in the recipe for jellied sliced peaches (see p. 8)

are equally applicable here. If the berries are highly acid it may be advisable to omit the lemon juice. On the other hand, if the berries are especially lacking in acid, lemon juice should be added.

The berries should be thoroughly washed before hulling and drained before weighing. Mix the sugar, lemon juice, and berries, then put on to cook at once. It is advisable to mash a very few of the berries in the bottom of the pan before adding the rest in order to prevent burning before the juice flows. Heat over a low fire until the sugar is dissolved, perhaps 3 to 5 minutes; then increase the heat strongly. Boil vigorously for 1 minute, with constant stirring. Remove from the stove and skim; add the pectin, then let the mixture stand, stirring from time to time until it is somewhat cool. Pour into jelly glasses and allow to stand overnight before sealing.

The berries should retain their color and shape, and should be surrounded by a soft, clear, red jelly. About 2 pints of preserves are obtained from the amounts given above. It is not wise to attempt to make up more than a pound of berries at one time.

This preserve is not easy to make; the short cooking period extracts little if any pectin from the berries, therefore the jelly texture depends wholly upon the added pectin. Furthermore, the short cooking does not completely extract the juice from the berries; juice continues to be drawn out even after the jelly has cooled because of action of the heavy sugar-and-pectin mixture by which the fruit is surrounded. Therefore in order to have success with this recipe it is necessary to use a pectin extract of unusual excellence, or else one of a high degree of concentration.

STRAWBERRY JELLY WITH ADDED PECTIN AND ACID.

1 cup strawberry juice.
1½ cups sugar.

5 tablespoons apple or lemon pectin
extract,
or 6 tablespoons orange pectin extract.

In order to extract the juice, add a few tablespoons of water to 1 pound of prepared fruit, or if the berries are quite ripe and mild in flavor, omit the water. Boil rapidly for a few minutes until the berries are soft. Strain through four thicknesses of cheesecloth.

Mix the juice thus extracted with the other ingredients in the proportions indicated above and boil rapidly until the jelly test is reached. The jelly should be bright red in color and should have a decided flavor of fresh strawberry.

If the berries are especially lacking in acid, 1 teaspoon of lemon juice may be added to each cup of strawberry juice.

Jellies from other berries.—Jellies may be made from the juices of other berries by the same method as that described under strawberry jelly or jellied fresh strawberries. Whether or not pectin is necessary or advisable for the making of raspberry and blackberry jellies depends entirely upon the condition of the fruit. In the case of red raspberries, its use for the purpose of shortening the time of cooking the berries is particularly advantageous from the standpoint of flavor.

SWEET VINEGAR JELLY WITH APPLE PECTIN EXTRACT.

1 cup vinegar.
1 cup water.
 $\frac{3}{4}$ cup apple pectin extract.

2 cups sugar.
Cloves, cinnamon, or other spices if desired.

If the vinegar happens to be one of unusually high or low acidity, the proportions of vinegar and water may have to be changed until a mixture of the desired degree of acidity is obtained. If the spices are to be used, place two to four 1-inch pieces of cinnamon and a clove in a small cloth bag and allow them to remain in the mixture for a few minutes during the cooking.

Combine all ingredients in the proportions indicated above, and boil until the jelly test is secured.

SCORE CARD FOR JELLY.

KIND OF JELLY ———.

NUMBER OF SAMPLES ———.

Points.	Perfect score.	Actual score.
1. Package: Glasses of good shape, suitable size, tops clean, tight, free from tarnish; paraffin layer (if any) smooth, no bubbles nor breaks; labels suitable, attractive.....	5
2. Color: Color natural, as determined by the fruit used, no artificial coloring except for mint jelly. Color deepened by wise use of sugar and other sweetener, not darkened by overcooking.....	10
3. Clearness: Transparent or translucent, not cloudy nor containing pulpy particles. No bubbles nor visible crystals. No mold nor signs of fermentation. No scum nor bubbles at top.....	10
4. Texture (judged after glass is opened): Jelly should hold its shape when turned out onto a plate; yet should quiver when plate is moved. Should cut easily with spoon, be tender, yet break with sharp cleavage line, and show sparkling faces. Not sticky, tough, gummy, nor brittle; not sirupy; not sugary; no crystals that can be perceived on tongue.....	40
5. Flavor: Attractive, pronounced fruity flavor, yet not too sour; nor yet over sweet; not caramelized, nor scorched.....	35
Total.....	100

Remarks:

ADDITIONAL COPIES

OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.

AT

5 CENTS PER COPY

PURCHASER AGREES NOT TO RESELL OR DISTRIBUTE THIS
COPY FOR PROFIT.—PUB. RES. 57, APPROVED MAY 11, 1922



